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Farrell

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[54] **ADJUSTABLE SWITCH POINT GUARD**

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[51] **Int. Cl.**[4] **E01B 7/02**

[52] **U.S. Cl.** ..... **246/435 A;** 246/441

[58] **Field of Search** ..... 246/435 A, 441, 456

[56] **References Cited**

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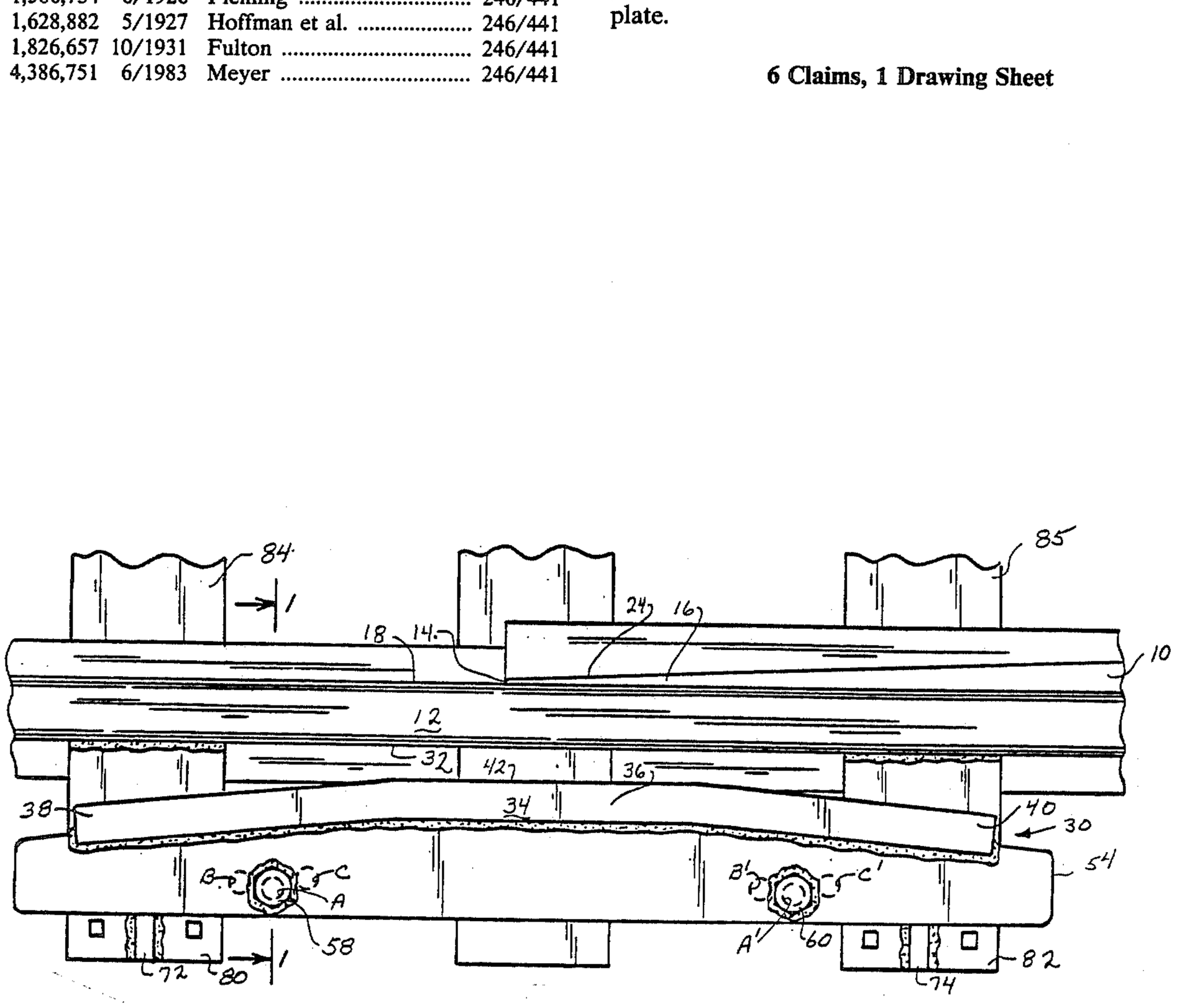
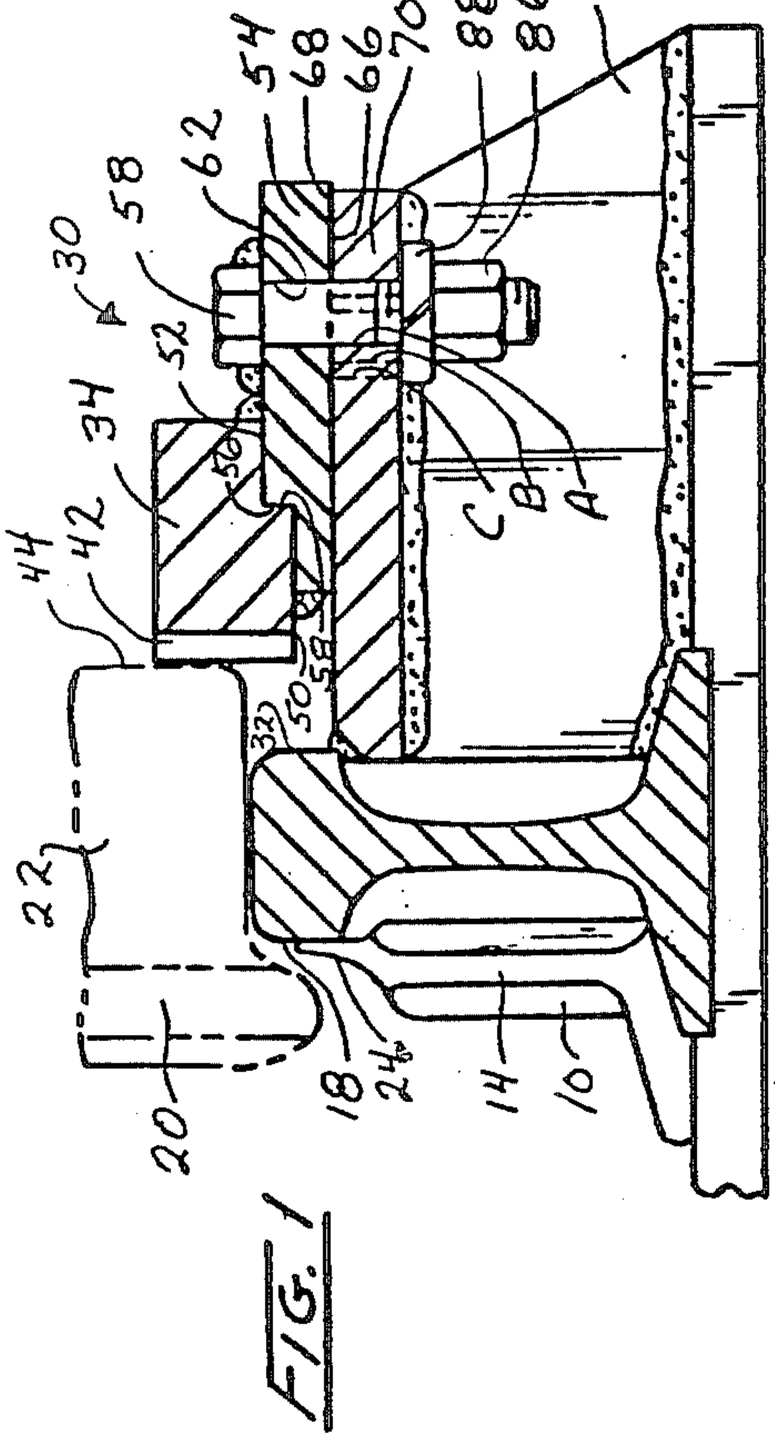
[57] **ABSTRACT**

An adjustable switch point guard includes a wear bar rigidly affixed to an adjustment plate. The adjustment plate is mounted on a fixed base plate which is attached to railroad ties. A threaded fastener on one of the adjustment plate or the base plate engages a first pair of bores in the other of the adjustment plate or the base plate to position the wear bar and adjustment plate 54 relative to a switch point and a fixed rail. Additional setes of bores are provided to enable the adjustment plate and wear bar to be moved relative to the base plate.

6 Claims, 1 Drawing Sheet




22
20
18
24
14
10
44
42
34
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58
62
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68
66
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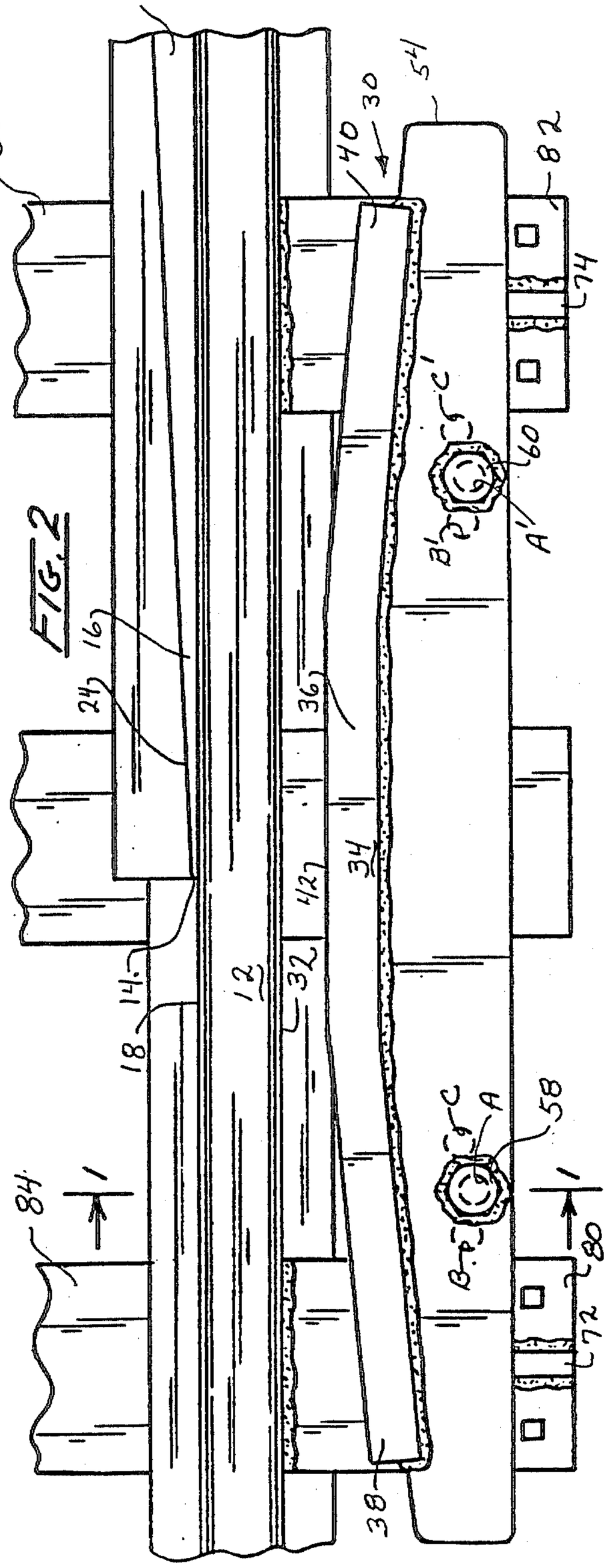
88
86
74
A
B
C

FIG. 1


85
40
30
54
82
74
60
A'
B'
C'
16
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34
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84
1
38
58
80
72

FIG. 2

ADJUSTABLE SWITCH POINT GUARD

BACKGROUND OF THE INVENTION

A railroad switch includes a switch point or rail having a point of switch at one end which terminates in a narrow tip adapted to be moved into contact with a stationary rail when rail traffic is to be diverted from the switch rail to the stationary rail or vice versa. The point of switch which may be three to four feet in length has a relatively thin cross sectional area, i.e., on the order of 1/16 to $\frac{1}{4}$ of an inch. If as a railroad car or locomotive wheel traverses a switch point it is allowed to engage the point of switch, it will cause this area to wear rapidly thereby necessitating its frequent repair or replacement. The tips of switch points especially are subject to wear when wheels engage the point of switch, because they have the narrowest cross-sectional area and some switch points are equipped with replaceable manganese tips which may be changed when they become worn excessively. In addition, if a wheel is traveling in a facing direction, i.e., towards the point as it moves through a switch and it is allowed to contact the tip, it is possible for the flange of the wheel to climb the switch point rail and become derailed. Also, if a wheel has a worn or thin flange and the tip of the point is worn, a wheel moving in a facing direction may pick the point, i.e., pass between the rail and the point and thereby cause a derailment.

Consequently, it has become common practice to provide a switch point guard rail or bar adjacent the switch point at the point of switch. The guard rail is positioned to engage the rim of a car or locomotive wheel on the side opposite the flange and to push the wheel laterally away from the point of switch so that it is not abraded by the flange as the wheel passes over that area of the switch point. Of course, this causes the guard rail to wear in place of the switch point. Consequently, to maintain the effectiveness of the guard rail, periodically it must be replaced or repositioned to compensate for the wear. Previous switch point guards have been unitary structures which were positioned with respect to switch points by being spiked into ties for the railroad track. A disadvantage inherent in guard rails which are spiked into ties resides in the fact that the spikes must be removed to reposition the guard rails and as these rails are replaced, over a period of time the repeated spiking of the ties renders them useless and they too must be replaced. In response to the disadvantages found in unitary guard rail structures, some guard rail structures have been developed which permit the wear portion of the structure to be replaced or repositioned with respect to the switch point when it becomes worn without moving the portion of the structure spiked to the ties. One problem associated with those guard rail structure having a wear element which may be adjusted or repositioned has been their excessive complexity and their use of relatively large numbers of parts. Often guard rails must be repositioned under adverse weather and working conditions by relatively inexperienced crews. Consequently, those structures employing complex adjustment mechanisms with multiple parts may be improperly installed. Furthermore, complex guard rail structures are expensive and may lack the rigidity required to hold them in a predetermined position under conditions of heavy usage.

It is desirable to provide a guard rail having an adjustable wear element which may be repositioned when the wear element becomes worn to provide additional protection for the point of switch, which utilizes a minimum number of parts and which may be constructed with a minimum of expense. Furthermore, it is desirable to provide a guard rail having an adjustable wear element mounted on a support structure adapted to be spiked to the railroad track ties wherein the wear element may be adjusted or replaced without having to remove the support structure.

SUMMARY OF THE INVENTION

The instant invention provides an adjustable switch point guard for use at the switch point of a railroad track having a wear bar positioned to engage the rims of railroad car wheels to prevent the flanges of the wheels from engaging the switch point. This guard comprises an adjustment plate wherein the wear bar is rigidly affixed to the adjustment plate and located a predetermined lateral distance from the switch point. The wear bar has a vertical wear face which engages the rims of railroad car wheels. The guard includes a base plate which mounts the adjustment plate and an adjustment means for fixedly attaching the adjustment plate to the base plate at a plurality of positions such that the wear bar may be spaced a plurality of predetermined distances from the switch point. The adjustment means includes a plurality of bores formed in one of the adjustment plate or base plate at different lateral distances from the switch point and a threaded connector attached to the other of the base plate or the adjustment plate wherein the threaded connector is installed in one of the bores to locate the adjustment plate and the wear plate at one of the predetermined distances.

Also provided is a method of adjusting a switch point guard for use at the switch point of a railroad track having a wear bar positioned to engage the rims of railroad car wheels to prevent the flanges of the wheels from engaging the switch point. The switch point guard having an adjustment plate and the wear bar being rigidly affixed to the adjustment plate and located a predetermined lateral distance from the switch point. The wear bar has a verticle wear face which engages the rims of railroad car wheels. The switch point guard further having a base plate which mounts the adjustment plate and an adjustment means for fixidly attaching the adjustment plate to the base plate at a plurality of positions such that the wear bar may be spaced a plurality of predetermined distances from the switch point. The adjustment means includes a plurality of bores formed in one of the adjustment plate or the base plate at different lateral distances from the switch point and a threaded connector attached to the of the base plate or the adjustment plate. The threaded connector is installed in one of the bores to locate the adjustment plate and the wear plate at one of said predetermined distances and a nut is turned on to the threaded connector. The method of adjusting the switch point comprises the steps of removing the nut from the threaded connector, lifting the adjustment plate vertically upward from the base plate to withdraw the threaded connector from one of said bores, displacing the adjustment plate laterally and into alignment with another of said bores, lowering the adjustment plate onto the base plate to cause the threaded connector to be received in the other bore and turning the nut onto the threaded connector to fixedly attach the adjustment plate to the base plate.

DISCRIPTION OF THE DRAWINGS

FIG. **1** is a sectional view along line **1—1** of FIG. **2**; and

FIG. **2** is a top view of the switch point guard mounted adjacent a switch point.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **2**, it may be seen that a switch point or rail **10** lies adjacent a fixed traffic rail **12**. In this figure, the tip **14** of the tapered point of switch portion **16** of switch point **10** has been brought into contact with the inner edge **18** of fixed rail **10** to obtain a switching condition. With this condition, the flange **20** of a railroad car wheel **22** will engage the inner edge **24** of switch point **10** when the wheel is traveling in a facing direction as may be seen in FIG. **1**. If the wheel **22** is traveling in a trailing direction, it will simply transfer from the point of switch portion **16** of switch rail **10** to fixed rail **12** and flange **20** will engage inner edge **18** of that rail to turn the wheel in the direction of rail **12**. The point of switch portion **16** of switch point **10** may be moved away from fixed rail **12** to allow traffic to proceed along rail **12** without entering switch point **10**.

A guard rail assembly **30** is mounted along a railroad track adjacent the outer edge **32** of fixed rail **12**. Referring again to FIG. **2**, it may be seen that rail assembly **30** includes a wear bar **34** having a straight midsection **36** which lies parallel to fixed rail **12** and a pair of tapered ends **38** and **40** which are attached to opposite ends of midsection **36**. Wear bar **34** has a verticle face **42** which engages the outer edge **44** of a car wheel **22** to push the wheel away from tip **14** and inner edge **24** of the point of switch **16** as depicted in FIG. **1**. As a result, abrasion and wear of the inner edge **24** of point of switch **16** by wheel flanges **20** is prevented when the wheels traverse switch point **10**. Typically, wear bar **34** is manufactured from a wear resistant alloy or subjected to a manufacturing process which increases is resistance to wear and abrasion. However, repeated contact with the outer edges **44** of car wheels **22** causes wear face **42** eventually to wear. When the wear reaches the point to where the flange **20** of the wheel **22** is not maintained a sufficient distance from tip **14** and inner edge **24** of point of switch **16**, wear bar **34** must be replaced or repositioned. The guard rail assembly **30** of the present invention provides an adjustment whereby wear bar **34** may be moved inwardly towards fixed rail **12** to compensate for wear twice subsequent to its initial installation. Thereafter, wear bar **34** must be replaced.

Guard rail assembly **30** will now be discribed in detail. Wear bar **34** has a stepped bottom surface **50** that is mounted on a complimentary stepped top surface **52** of an adjustment plate **54**. A plurality of welded joints secure wear bar **34** to adjustment plate **54**. A verticle edge **56** formed on the top of adjustment plate **54** acts against a similar edge **58** formed on the bottom of wear bar **34** to resist lateral movement of the bar when the outer edge **44** of a car wheel **52** engages verticle face **42**.

A pair of threaded fasteners **58** and **60** pass through bores **62** formed in adjustment plate **54**. Fasteners **58** and **60** may be bolts which are retained in place by welding. Alternatively, bores **62** may be threaded and fasteners **58** and **60** may be threaded studs that are turned into bores **62**.

The bottom surface **66** of adjustment plate **54** rests upon the top surface **68** of a horizontally extending base plate **70**. Base plate **70** is supported by a pair of vertically extending gussets **72** and **74**. The top surfaces of gussets **72** and **74** are rigidly affixed to the bottom surface **76** of base plate **70** by welds. Gussets **72** and **74** are mounted on end tie plates **80** and **82**, respectively. Tie plates **80** and **82** are spiked into railroad ties **84** and **85** to secure guard rail assembly **30** in position adjacent to fixed rail **12** and switch point **10**. Three pairs of bores A and A′, B and B′, and C and C′ are formed in base plate **70**. The center lines of each pair of bores, A and A′, B and B′ and C and C′, are spaced apart by the same distance that separates the center lines of fasteners **58** and **60**. In order to mount wear bar **34** and adjustment plate **54** on base plate **70**, adjustment plate **54** is moved until threaded fasteners **58** and **60** are aligned with one of the pairs of bores. When wear bar **34** is new, fasteners **58** and **60** are aligned with bores A and A′ as shown in FIGS. **1** and **2** and the fasteners are inserted into these bores. Thereafter, nuts **86** are turned onto fasteners **58** and **60** until they engage and compress lock washers **88** to thereby secure adjustment plate **54** to base plate **70**.

It may be observed that bores B and B′ are positioned inwardly of bores A and A′ towards fixed rail **12** and that bores C and C′ are positioned inwardly of bores B and B′ towards fixed rail **12**. Consequently, when wear bar **34** becomes worn in the initial position, it may be moved to a second position in which fasteners **58** and **60** pass through bores B and B′. When wear bar **34** becomes worn in the second position, it may thereafter be moved to a third position in which the fasteners **58** and **60** pass through bores C and C′ respectively. Bore B and B′ are offset laterally to one side of bores A and A′, respective, and bores C and C′ are offset laterally to the opposite side of bores A and A′, respectively, so that wear bar **34** remains close to its initial position as defined by bores A and A′ when it is in the second and third position.

In order to reposition adjustment plate **54** and wear bar **34** from one set of bores to another, it is necessary only to remove the nut **86** and washers **88** from fasteners **58** and **60** and, lift adjustment plate **54** vertically upward from base plate **70** to withdraw the fasteners **58** and **60** from the bores they occupy. Thereafter, adjustment plate **54** is moved horizontally until fasteners **58** and **60** are aligned with the bores in base plate **70** which define the next desired position for wear bar **34**. Subsequently, plate **54** is lowered onto base plate **70** and thereafter nuts **86** are turned onto fasteners **58** and **60** until their lock washers **88** are compressed.

Although in the preferred embodiment the threaded fasteners are shown mounted on the adjustment plate **54** and the sets of positioning bores A and A′, B and B′ and C and C′ are shown formed in base plate **70**, the adjustment mechanism, would work equally well if the threaded fasteners **58** and **60** projected upwardly from the top surface **68** of base plate **70** and the adjustment bores A and A′, B and B′ and C and C′ were formed in adjustment plate **54**. In this instance, adjustment plate **54** would be repositioned on base plate **70** by removing the nut **86** and washer **88** from each threaded fastener **58** and **60**, lifting adjustment plate **54** vertically upward from base plate **70** to cause fasteners **58** and **60** to be withdrawn from one of the sets of bores. Thereafter adjustment plate **54** would be moved to align the set of bores defining the desired position with fasteners **58** and **60** and would be lowered onto base plate **70** such that fasteners **58** and **60** would pass through the selected set of bores. Adjustment plate **54** would be secured onto

base plate **70** by turning a nut **86** onto each fastener **58** and **60** until it compressed the lock washer **88**.

It may be observed that adjustment plate **54** and wear bar **34** may be removed from base plate **70** and replaced or repositioned thereon without disturbing the base plate **70**. Consequently, the support structure consisting of base plate **70**, gussets **72** and **74** and end tie plates **80** and **82** remain in position when adjustment plate **54** and wear bar **34** are repositioned or replaced. Thus, end tie plates **80** and **82** are spiked into railroad ties **84** and **85** when the guard rail assembly **30** is installed initially and are not disturbed when wear bar **34** and adjustment plate **54** are replaced or repositioned.

Since certain changes may be made in the above-described system and apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. An adjustable switch point guard for use at the switch point of a railroad track having a wear bar positioned to engage the rims of railroad car wheels to prevent the flanges of the wheels from engaging the switch point which comprises:

an adjustment plate;

said wear bar rigidly affixed to said adjustment plate and located a predetermined lateral distance from said switch point;

said wear bar having a vertical wear face which engages the rims of railroad car wheels;

a base plate which mounts said adjustment plate;

a plurality of lateral adjustment means for fixedly attaching said adjustment plate to said base plate at a plurality of lateral positions such that said wear bar may be spaced a plurality of predetermined lateral distances from said switch point; and

each of said lateral adjustment means including a plurality of bolt receiving adjustment bore means formed in one of said adjustment plate or said base plate at different lateral distances from said switch point and a threaded connector means attached to the other of said base plate or said adjustment plate; and

said threaded connector being installed in one of said bolt receiving bore means to thereby locate to said adjustment plate and said wear bar at one of said plurality of predetermined lateral distances and to firmly affix said adjustment plate to said base plate.

2. The adjustable switch point guard of claim **1** which includes:

a plurality of vertically extending gussets which mount said base plate;

a tie plate connected to each gusset; and

connecting means for connecting said tie plates to rail ties.

3. The switch point guard of claim **1** in which the plurality of bolt receiving bore means includes three bores formed in one of said adjustment plate or said base plate at different lateral distances from said switch point.

4. The adjustable switch point guard of claim **1** in which:

a nut is turned onto said threaded connector means subsequent to said threaded connector being installed in one of said bolt receiving adjustment bore means.

5. The switch point guard of claim **4** in which: said threaded connector means is welded to said adjustment plate.

6. A method of adjusting a switch point guard utilizing the switch point guard of claim **3** comprising the steps of:

removing said nut from said threaded connector means;

lifting said adjustment plate vertically up from said base plate to withdraw said threaded connector from said one of said bolt receiving adjustment bores;

displacing said adjustment plate laterally and aligning said

threaded connector means with another of said bores;

lowering said adjustment plate onto said base plate to cause said threated connector means to be received in said other bore; and

turning said nut onto said threaded connector means to fixedly attach said adjustment plate to said base plate.

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